

can be because they believe that myth so they take their medication not based on indications. This mistake can cause other health issues and increase the health burdens in Indonesia. In 2014, generic medicine consumption in Indonesia reached 60-70% and always increases every year. Annual data showed that the Jaminan Kesehatan Nasional (JKN) program and Indonesian Government spend Rp 1.3 trillion for generic medicine availability in primary health care⁵.

Therefore, the researcher aimed to identify any associations between knowledge about gout arthritis in Indonesia with allopurinol and NSAID consumption. If there is association between them, it can assist the public and national government so these health problems can be better resolved. This research was conducted in Rumah Susun Penjarangan because it was accessible for the researcher which enabled more and varied data so the accuracy was increased.

RESEARCH METHODS

The research was a cross-sectional study. The data were collected by interviewing people in Rumah Susun Penjarangan by using a validated questionnaire. The questionnaire contains an informed consent form, 24 closed-ended questions to measure knowledge about gout arthritis (13 questions based on etiology, predisposition factors, complication, and diagnosis; 7 questions based on diet; and 4 questions based on sign and symptoms), and

4 closed-ended questions about NSAID and allopurinol consumption.

The samples in this research were 75 samples (68 samples and 7 samples for 10% drop out) with 90% confidence interval (CI) in Rumah Susun Penjarangan who are ³ 50 years old and agreed to participate in this research by signing an informed consent form in the questionnaire after the researcher gave the explanation about this research. Samples were collected by using simple random sampling.

The researchers processed data by editing, coding, and cleaning, and then analyzed the data with the SPSS program using chi-squared methods. This research was approved by the Department of Ethic, Faculty of Medicine and Health Science Atma Jaya Catholic University of Indonesia.

RESULTS

The data results included demography (gender, age, marital status, occupation, and education level), knowledge about gout, NSAID and allopurinol consumption, association between knowledge about gout arthritis and allopurinol consumption, and association between knowledge about gout arthritis and NSAID consumption. The following tables present the research data results.

1. Respondents' Demography

Table 1.1. Respondents' Demography

	Frequency(N)	Percentage(%)
Gender		
Male	32	47.1
Female	36	52.9
Age		
50 – 59 years old	58	85.3
60 – 69 years old	9	13.2
≥ 70 years old	1	1.5
Marital Status		
Single	0	0
Married	67	98.5
Widow / Widower	1	1.5
Occupation		
No Occupation	4	5.9
Housewife	26	38.2
Driver	3	4.4
Retired	2	2.9
Trader	5	7.4
Others	28	41.2
Education Level		
Not Going to School	2	2.9
Primary School	12	17.6
Junior High School	18	26.5
Senior High School	32	47.1
College	4	5.9
Total	68	100

Table 1 above shows that 52.9% respondents are female. For age, as many as 85.3% of respondents are 50 – 59 years old and 13.2% respondents are 60 – 69 years old. For occupation, as many as 41.2% of respondents' occupation are others and 38.2% respondents are housewife. And for education level, as many as 47.1% of respondents' education level are senior high school and 26.5% of

respondents' education level are junior high school.

2. Results

Based on Table 2.1, respondents' knowledge about gout arthritis are insufficient (70.6%). Mainly, respondents' knowledge about gout arthritis is based on etiology, predisposing factors, diagnosis, and complications (73.5%).

Table 2.1. Respondents' Knowledge About Gout Arthritis

	Frequency (N)	Percentage (%)
Respondents' Knowledge about Gout Arthritis		
Sufficient	20	29.4
Insufficient	48	70.6
Respondents' Knowledge About Gout Arthritis Based on Etiology, Predisposing Factors, Diagnosis, and Complications.		
Sufficient	18	26.5
Insufficient	50	73.5
Respondents' Knowledge About Gout Arthritis Based on Diet		
Sufficient	34	50
Insufficient	34	50
Respondents' Knowledge About Gout Arthritis Based on Sign and Symptoms		
Sufficient	55	80.9
Insufficient	13	19.1

Table 2.2. Respondents' NSAID and Allopurinol Consumption History

	Frequency (N)	Percentage(%)
NSAID Consumption History		
Based on Doctors' Prescriptions	24	35.3
Not Based on Doctor's Prescription	19	27.9
Not Consuming	25	36.8
Allopurinol Consumption History		
Based on Doctor's Prescription	11	16.2
Not Based on Doctor's Prescription	9	13.2
Not Consuming	48	70.6
Total	68	100

Based on table 2.2 above, for NSAID consumption history, 36.8% of respondents were not consuming and 35.3% of respondents' consumption were based on doctors' prescriptions. For allopurinol consumption history, 70.6% of respondents were not consuming and 16.2% of respondents' consumption were based on doctors' prescriptions.

Further analysis was conducted by using chi-squared methods (90% CI). The analysis result showed *p* value 0.234 ($p > 0.05$). This result means there was no association between knowledge about gout arthritis and NSAID consumption history.

Table 2.3. Association between Knowledge about Gout Arthritis and NSAID Consumption History

	NSAID Consumption Based on Doctors' Prescriptions	NSAID Consumption not Based on Doctors' Prescriptions	Not Consuming NSAID	Total (p = 0.234)
Sufficient Knowledge	4 (5.9%)	7 (10.3%)	9 (13.2%)	20 (29.4%)
Insufficient Knowledge	20 (29.4%)	12 (17.6%)	16 (23.6%)	48 (70.6%)
Total	24 (35.3%)	19 (27.9%)	25 (46.8%)	68 (100%)

Table 2.4. Association between Knowledge about Gout Arthritis and Allopurinol Consumption History

	Allopurinol Consumption Based on Doctors' Prescriptions	Allopurinol Consumption not Based on Doctors' Prescriptions	Not Consuming Allopurinol	Total (p = 0.666)
Sufficient Knowledge	2 (2.9%)	3 (4.4%)	15 (22.1%)	20 (29.4%)
Insufficient Knowledge	9 (13.3%)	6 (8.8%)	33 (48.5%)	48 (70.6%)
Total	11 (16.2%)	9 (13.2%)	48 (70.6%)	68 (100%)

Further analysis was conducted by using chi-squared methods (90% CI). The analysis result showed *p* value 0.666 ($p > 0.05$). This result means there was no association between knowledge about gout arthritis and allopurinol consumption history.

Based on the data results, the majority of respondents in Rumah Susun Penjaringan / Penjaringan Flat House do not have sufficient knowledge about gout arthritis, mainly based on etiology, predisposing factors, diagnosis, complication, and diet.

DISCUSSION

1. Public Knowledge About Gout Arthritis

Based on a research conducted in United States (US) in 2019, less than 25% of respondents have sufficient knowledge

about gout arthritis based on diet⁶. This study also found the same result which showed 50% of respondents have insufficient knowledge about gout arthritis based on diet. Based on a research conducted in China, only 22.5% of respondents have sufficient knowledge about gout arthritis based on diet⁷.

Based on a research conducted in New Zealand, many people did not know about gout arthritis before they were diagnosed gout arthritis by health professionals. So, health professionals are important to give education to the public about gout arthritis⁸.

As in many developing and developed countries, many Indonesian people have insufficient knowledge about gout arthritis. Based on a research conducted in Surakarta in 2015, 18 of 30 respondents (60%) have insufficient knowledge about gout arthritis⁹. Additionally, based on a research conducted in Tomohon in 2016, only 9 of 37 people have sufficient knowledge about gout arthritis¹⁰.

Based on those research results, it can be concluded that many people have insufficient knowledge about gout arthritis not only in Indonesia, but also in some developed countries like the US, New Zealand, and China. Education about gout arthritis needs to be given by health professionals to the public so people will have sufficient knowledge about gout arthritis.

2. The Association Between Knowledge About Gout Arthritis with NSAID and Allopurinol Consumption.

This is the first research conducted in Indonesia about the association between knowledge about gout arthritis with NSAID and allopurinol consumption. Hypothesis (Ha) of this research was: There is associations between knowledge about gout arthritis with NSAID and allopurinol consumption. Researcher hypothesized that people who have insufficient knowledge about gout arthritis will consume NSAID and allopurinol without doctors' prescriptions. Also people, who have sufficient knowledge about gout arthritis will consume NSAID and allopurinol based on doctors' prescriptions.

Based on Tables 2.3 and 2.4, many respondents who have insufficient knowledge about gout arthritis consume NSAID and allopurinol based on doctors' prescriptions compared with respondents who have sufficient knowledge about gout arthritis.

Based on the analysis result, there is no association between knowledge about gout arthritis with NSAID and allopurinol consumption. Accordingly, the hypothesis from this research cannot be proved. From a research conducted in Australia which included respondents who are cystic fibrosis patients, the results showed from three kinds of medication (dornase alpha, multivitamin, and hypertonic saline solution), patients' knowledge about gout arthritis only affected their adherence to one kind of medication (hypertonic saline solution)¹¹.

A research in Taiwan also showed the same results. That research aimed to identify any association between patients'

knowledge about type 2 diabetes mellitus (T2DM) with their adherence to T2DM management and the result found no association between their knowledge about T2DM with their adherence to T2DM management mainly relating with chronic disease management¹².

A research about the association between knowledge about T2DM with patients' adherence to medication was also conducted in Pakistan. The conclusion from that study found patients who have sufficient knowledge about their diseases did not guarantee patients' adherence to their scheduled medication¹³.

Those studies all show the same result that patients' knowledge about their disease did not guarantee their adherence to having their medications from doctors. Beside developing new medications, increasing patients' adherence to their medication is an important rule and has positive impacts to patients' health conditions¹⁴. However, patients' adherence to medication (chronic disease medication) is one of main issues in public health discussions. In developed countries, patients' adherence to medication is also a challenging issue as well. Many patients have low adherence to medication. Low adherence to medication not only relates to health conditions, but also to healthcare costs.

It is estimated that patients' low adherence to medications contributes to 75% of failures in medication¹⁵. It is also estimated that nonadherence contributes significantly to avoidable healthcare costs every year. In the US, nonadherence to medication contributes to 125,000 deaths and costs \$ USD 100 billion every year. But, Indonesia is currently lacking the data about patients' adherence to medication.

Presently, several methods or strategies were developed to increase adherence to medication which have positive impacts in the future¹⁶. One of the positive impacts from increasing patients' adherence to medication is less health care costs. Other than that, further analysis needs to be conducted about other factors which contribute to medication consumption besides knowledge about a disease so people can consume medication based on its indications.

This research has some limitations which include it was conducted only in one location (Rumah Susun Penjaringan) and the data were collected from a small sample of people in Rumah Susun Penjaringan which limits the generalizability of the findings.

CONCLUSIONS

This study concluded that the majority of respondents have insufficient knowledge about gout arthritis, there are more respondents who are consuming NSAID than consuming allopurinol, and there is no association between knowledge about gout arthritis with NSAID and allopurinol consumption. The recommendations for this study are:

1. For Researchers

Future studies should collect more data in several places so the results can be generalized. Also, more assessment and research are needed about how health professionals give

prescriptions to patients so the prescriptions are based on a working diagnosis.

2. For Health Professionals

Health professionals need to give more education about gout arthritis so the public has sufficient knowledge about gout arthritis.

3. For the Government

There should be more data about public obedience to scheduled medication. The data about public obedience to medication can help the government make interventions if the public's adherence is low.

Acknowledgements

I would like to thank dr. Erfen Gustiawan Suwangto, Sp. DLP., SH., M.H. Kes as my advisor so this research can be done and also I would like to thank Rumah Susun Penjaringan who have given permission to researcher for collecting data for this research so this research can be conducted.

Ethical Approval and Informed Consent

This research has been approved by Department of Ethics, Faculty of Medicine and Health Science, Atma Jaya Catholic University of Indonesia. Made with reference number 04/03/KEP-FKUAJ/ 2019.

Funding

Self funding

Availability of Data and Material

Data and material can be accessed via the corresponding author

REFERENCES

1. Ministry of Health, Republic of Indonesia. Health Field Study Seminar. Jakarta: Ministry of Health, Republic of Indonesia; 2017.
2. Ministry of Health, Republic of Indonesia. Decree of the Minister of Health, Indonesia number HK.01.07/Menkes/395/2017 Concerning the List of National Essential Medicines. Jakarta: Ministry of Health, Republic of Indonesia; 2017.
3. Ministry of Finance, Republic of Indonesia. Indonesian Economy and 2017 State Budget [Internet]. Jakarta: Ministry of Finance, Republic of Indonesia; 2017 [cited 2018 April 2]. Available from: <https://www.kemenkeu.go.id/apbn2017>
4. Ministry of National Development Planning/Bappenas. Health Development Challenges in Indonesia. Jakarta: Ministry of National Development Planning/Bappenas; 2017.
5. Farmalkes Ministry of Health, Republic of Indonesia. Use of generic drugs in Indonesia reaches 70%. Jakarta: Directorate General of Pharmaceutical and Medical Devices, Ministry of Health, Republic of Indonesia; 2014. Available from: <http://farmalkes.kemkes.go.id/2014/05/penggunaan-obat-generik-di-indonesia-capai-70/#.WuWreMaB3R0>
6. Singh JA. Patient perspectives in gout: a review. *Current Opinion in Rheumatology*. 2019 Mar 1;31(2):159-66.
7. Zhang P, Mou Y, Gu J. Questionnaire survey evaluating hyperuricemia-related control knowledge on 280 patients with gout [abstract]. In: Scientific Abstracts. United Kingdom: Annals of the Rheumatic Diseases. 74 (Suppl2); 2015. 1290-91. AB1160.
8. Rolston CJ, Conner TS, Stamp LK, Neha T, Pitama S, Fanning N, et al. Improving gout education from patients' perspectives: a focus group study of Māori and Pākehā people with gout. *Journal of Primary Health Care*. 2018 Oct 1;10(3):194-200.
9. Utomo WS, Supratman SK, Kep M, Yulian V. The effect of providing gout health education on the knowledge and attitudes of gout sufferers in the Gatak Suharjo Community Health Center [skripsi]. Surakarta: Faculty of Medicine, Universitas Muhammadiyah Surakarta; 2016.

10. Runtuwene Y, Purba RB, Kereh PS. Purine intake and knowledge level with uric acid levels at the Rurukan Community Health Center, Tomohon City. *Jurnal GIZIDO*. 2016 Nov 1;8(2):1-10.
11. Foster JM, Faint N, Staton J, Stick S, Schultz A. The relationship between disease knowledge, self-efficacy and adherence to treatment in adolescents with cystic fibrosis [abstract]. In: Poster Discussion Session; San Francisco, 15 Mei 2016. New York: Am J Respir Crit Care Med. 193; 2016: A2682.
12. Yeh JZ, Wei CJ, Weng SF, Tsai CY, Shih JH, Shih CL, et al. Disease-specific health literacy, disease knowledge, and adherence behavior among patients with type 2 diabetes in Taiwan. *BMC Public Health*. 2018 Dec;18(1):1-5.
13. Abbas A, Kachela B, Arif JM, Tahir KB, Shoukat N, Ali NB. Assessment of medication adherence and knowledge regarding the disease among ambulatory patients with diabetes mellitus DM in Karachi, Pakistan. *Journal of Young Pharmacist*. 2015;7(4):328-40.
14. Brown MT, Bussell J, Dutta S, Davis K, Strong S, Mathew S. Medication adherence: truth and consequences. *The American Journal of the Medical Sciences*. 2016 Apr 1;351(4):387-99.
15. Dunbar-Jacob J, Rohay JM. Predictors of medication adherence: fact or artifact. *J Behav Med*. 2016 Dec;39(6):957-68.
16. Bilger M, Wong TT, Lee JY, Howard KL, Bundoc FG, Lamoureux EL, et al. Using adherence-contingent rebates on chronic disease treatment costs to promote medication adherence: results from a randomized controlled trial. *Applied Health Economics and Health Policy*. 2019 Dec;17(6):841-55.